EXHIBIT R

DRAFT OCCURRENCE REPORT
DFS CYCLONE BIN ENCLOSURE INCIDENT
OF
30 APRIL 2000, EXTRACT

DFS Cyclone Bin Enclosure Incident of 4/30/00

Occurrence Report No: 000430-C1 Action Level: 2

DRAFT

Introduction:

Brief Description of Event: At approximately 09:40, Sunday (4/30/00), personnel discovered a fire in the DFS Cyclone Bin Enclosure. The fire was extinguished and minor damage was noted.

Major Consequences: Material damage

Site Investigative Team:
The following personnel from the Site Investigative Team were assigned on 4/30/00:

Team Member	Job Title	Shift
Eric Dawson	Safety/Fire Protection Engineer	Days
John Druyer	Shift Safety Representative	Days
Curtis Goodell	Engineering Lead	Days
Thane Eyre	DFS Engineer	Days
Sam Spangler	Con Operator	C
Jim Hebert	SCRO	C

Investigative Plan: Determine the sequence of events. Determine the cause of the event and the extent of damages. Ascertain if TOCDF procedural & hardware systems performed in accordance with their designed intent, and if personnel acted appropriately and within the scope of their responsibilities.

Key Due Dates: None

Background: At approximately 08:48, in preparation for an entry into the DFS to clear a jam in the HDC, the blind flange was installed between the kiln and the afterburner (upstream of the cyclone). At 08:48:44, the A/B chamber went extremely negative reading –6" water column (W.C.) and the Con operator attempted to make adjustments in order to compensate.

Narrative of Event:

At approximately 09:45, Sunday (4/30/00), while passing by the north side of the PAS, Rod Holum (maintenance) noticed that heat & some minor amounts of smoke were coming from the DFS Cyclone Bin. He also noticed that the roll up door was bowed out significantly. He immediately contacted Greg Tonkin (PAS operator) at the PAS office whereupon they notified the Control room. The Control Room immediately contacted the Fire department. John Skinner (PAS utility lead) was advised of the situation and began to investigate.

Concurrently, from approximately 08:48 to 09:46, Rodney Chaney (Control Room DFS operator), was attempting to gain control of an upset pressure condition in the DFS afterburner chamber. From 09:24:14 to 09:25:14, the DFS afterburner (AB) went from –

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6" W.C. to 0" of W.C. and remained at that pressure until approximately 09:46:44. At 09:46:44 the AB chamber pressure ultimately returned to the negative range (see attachments 1 & 3).

Note: 16-Pit-065 only registers pressures between 0" and –6" of W.C. Pressures more positive than 0", and more negative than –6" are not presently indicated by this sensor.

At approximately 09:55, Bob Banks (CON Superintendent) and Rich Renzello (BRA/RHA lead) arrived with the key to access the bin enclosure. Noting that there was no longer any smoke visible and the door was no longer bowed out, they began a slow and incremental approach to discover the cause of the fire. Upon gaining access to the enclosure, they discovered a small fire in the enclosure's vent line filter box (figure 4). Attending personnel attempted to extinguish the fire using a hand held ammonium phosphate based (dry chemical) fire extinguisher. Their attempts to put out the fire failed and they concluded that complete & final extinguishment, using a dry-chemical fire extinguisher, might not be possible at that. Concerned that the enclosure's vent line might allow the fire to spread to the MDB filter banks, John Skinner closed the 4" OS&Y slide gate valve, potentially preventing the spread of the fire. Upon accomplishing this, they egressed and closed the cyclone bin enclosure and waited for the fire department to arrive.

Cyclone Enclosure Vent Valve
(figure 1)

Note: The designed intent of the enclosure's vent line is to pull atmospheric contaminants from the cyclone bin enclosure, into the MDB filter banks. As a direct result of the responding personnel (John Skinner, Bob Banks, Rich Renzello, Rod Holum, Greg Tonkin, Mark Kessinger, and Mike Montano) closing the enclosure's vent valve (figure 1), the fire was contained to only the vent filter assembly, thereby isolating the MDB filter banks from potential fire damage.

At approximately 10:03, the DCD Fire Department arrived at the scene and evaluated the conditions in, and about, the enclosure. According to their report (see attachment 5), the responding fire department personnel witnessed "nothing showing" but chose to "connect to hydrant and pull hand line" as conservative measures. They monitored the scene with a heat gun (pyrometer) to determine if and where there might be indications that the fire

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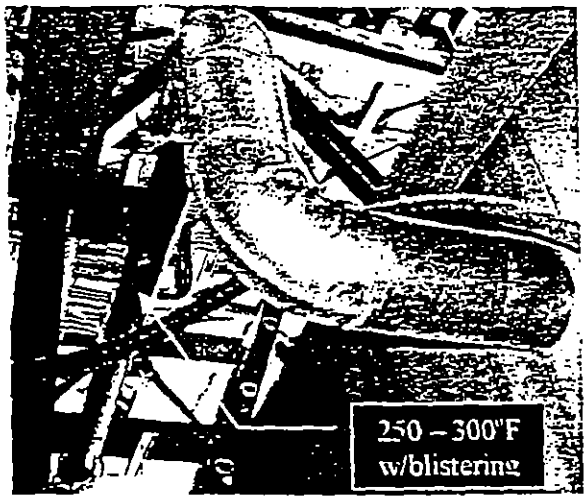
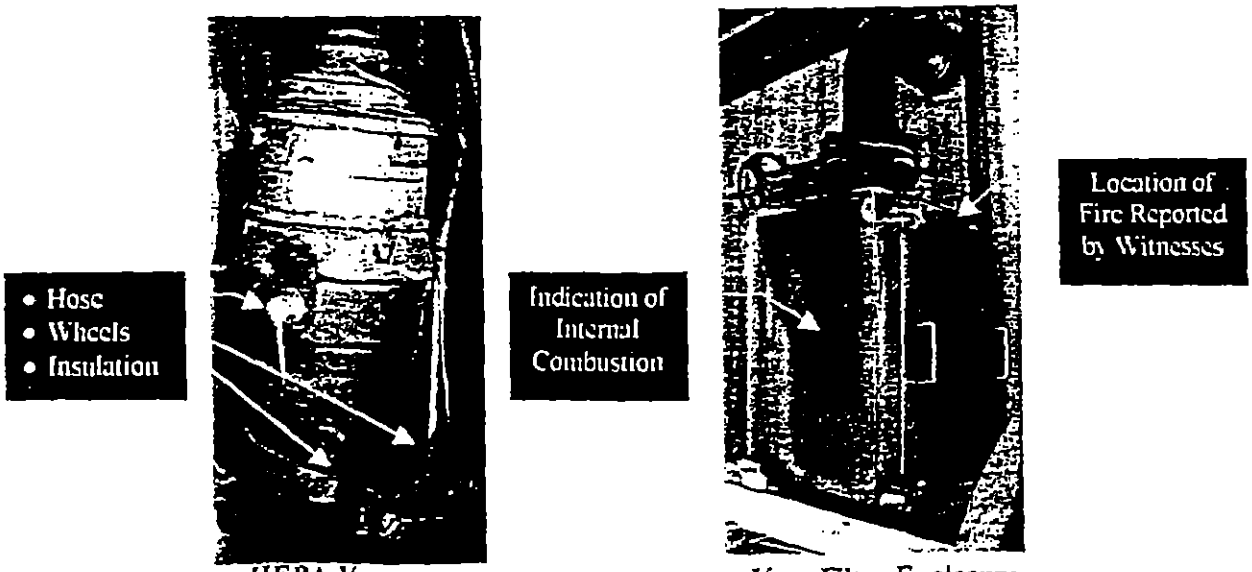
was ongoing, and where the combustion existed in it's lifecycle. It was determined that there were no signs of continued rapid oxidation. It was also determined that there were several locations where metal material temperatures remained elevated. Most specifically, all the metal material of the vent line itself. To enable the fire fighters to determine the actual temperature of the vent line, approximately 5' to 6' of insulation was removed and readings were taken which yielded non-insulated pipe temperatures ranging from 250°F to 300°F (figure 2). The responding fire crew remained on site for approximately 45 minutes until it was assured that there was no continued fire threat.



Exposed 4" Vent Pipe
(figure 2)

During the inspection of the Cyclone bin enclosure, evidence was found which showed that the enclosure had experienced elevated temperatures sufficient to melt various polypropylenes (PP) and butyl-rubber compounds such as, the hose, wheels, and wire insulation of the HEPA vacuum (figure 3).
Note: The maximum service temperature of polypropylene (hose material) is 320°F.



HEPA Vacuum
(figure 3)

Vent Filter Enclosure
(figure 4)

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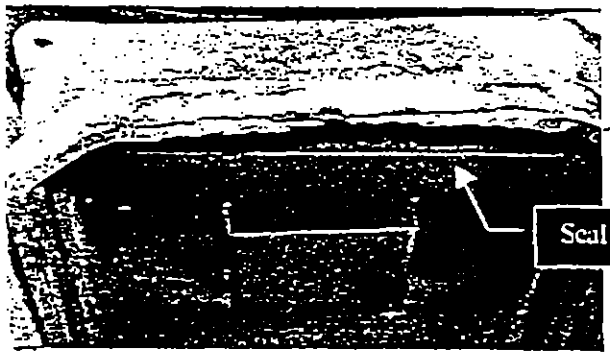
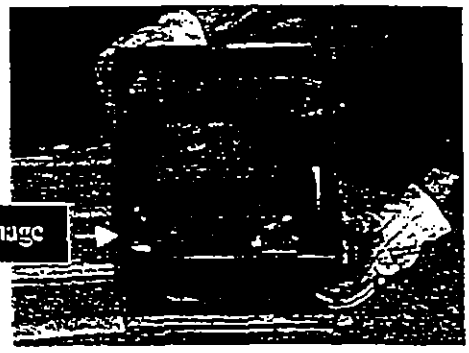
The inspection of the vent filter box and it's contents showed that a section of the primary cover seal had charred/ burned (approximately 10 inches wide) at the upper most edge and the rubber seal on the charcoal filter box assembly had melted/charred away entirely. Thermoplastics, such as flexible polyurethane foams, may ignite at temperatures as low as 780° Fahrenheit (F), and/or flash at 565°F. It is of some interest to note that flexible polyurethane foam type materials tend to absorb heat during the process of intumescing at temperatures as low as 300°F. Also, these types of thermoplastic materials may tend to melt, shrink away, and char well in advance of them igniting. As can be seen by the pictures of the gasket materials (figure 5), the outer cover gasket was not externally exposed to temperatures of 565°F (flash point).



Vent Filter Cover & Seal
(figure 5)



Vent Filter Seal and Filter medium
(figure 6)

It is also of some value to recognize that the charcoal filter material (activated carbon, charcoal) had partially decomposed as evidenced by the residual carbon black inside of the vent filter casing and internal components. (Note: The flash point of this charcoal filter material is 626°F.) The burning charcoal then exposed the upper 65% of the filter casing to temperatures exceeding the lower ignition temperature of the outer gasket material. This would explain the disparity between the condition of the gasket material below that area and the charred material above it. It is quite possible that the atmospheric temperature of the enclosure did not actually reach the charcoal's flash point. But rather the increased air velocity (bellows effect), that was created by the vacuum of the MDB filter banks, may have increased the oxidation rate of the charcoal thereby allowing it to ignite at the lower than previously identified flash point of 626°F. As there were several variables to the equation, there is not enough data to determine the precise temperature that the charcoal was burning at. However, at a minimum, the charcoal would most certainly burn at a greater temperature than the ignition temperature of the polyurethane foam gasket materials. Consistent with the statements of the witnesses and the physical evidence present, it is believed that the burning charcoal then decomposed & ignited the cover seal (figure 5) as well as the interior filter seal on the top surface of the filter case (figure 6). The fire also traveled an unknown distance up through the vent. The temperature readings taken by the fire department on the pipe surface (figure 2) and the blistering of the surface coating confirm this. Although some damage to the 2 vent valve

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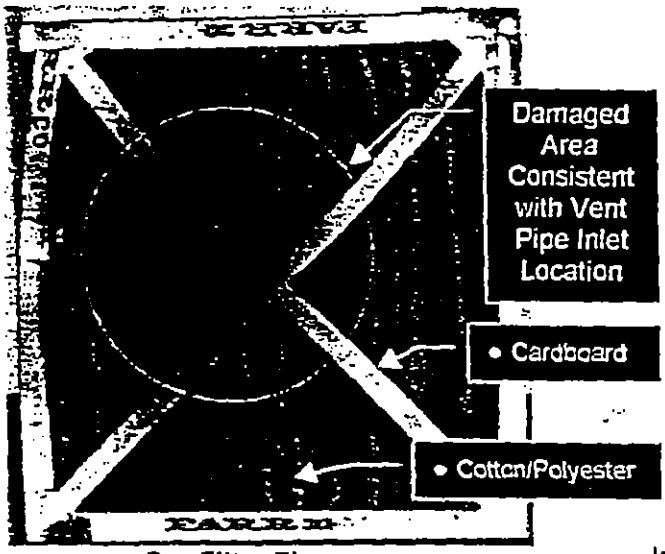
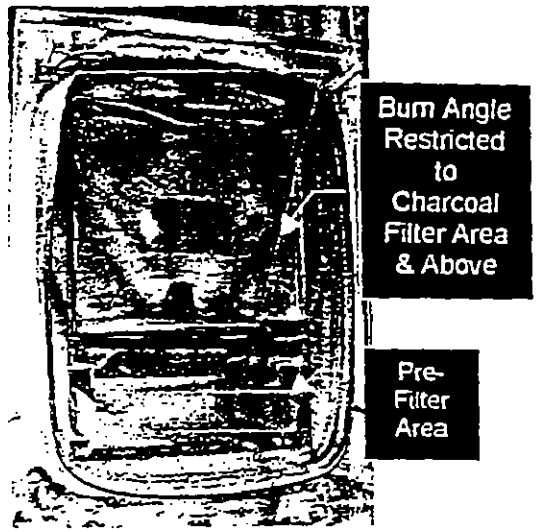
seals was externally evident (figure 1), internal examinations were not conducted at the time. However, it is expected that these seals will require replacing during system repair.



Pre-Filter Element
(figure 7)



Interior of Vent Filter Assembly
(figure 8)

The pre-filter element, composed mostly of cotton & polyester, did not readily ignite (figure 7), but did indicate some degree of decomposition as a result of the hot gasses passing through the filter element. This filter media has a maximum useful temperature limit of 200°F (intermittent). And as it does show some minor degree of damage, it is evident that the inlet temperature exceeded this amount. This is consistent with the data, which showed that the temperature inside of the cyclone bin enclosure was sufficient to melt the polypropylene plastic material (i.e. >320°F). The lack of oxidized material is also supportive of the theory that most of the actual burning took place in the filter casing immediately downstream of this element.

Unrecoverable damage to the system was contained to (2) polyurethane foam seals, (2) 4" flange gaskets, (1) furnace pre-filter, (1) refill of charcoal filter material, and approximately 5' of 4" pipe insulation. Damage to ancillary equipment was limited to the HEPA vacuum hose, wheels, and wiring. Total cost of equipment replacement/repairs is estimated at under $1,000.00.

Note: Subsequent, "not confirmed" agent readings in the enclosure were, in all probability, the result of numerous by-products of the combustion of the rubber &/or plastic fuels present (attachment 4).

Identification of Cause:

The installation of the blind flange, while the AB was running, eliminated the supply of air from the kiln which caused the AB chamber pressure to go very negative. This

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negative pressure condition then slowed the exhaust flow, which in turn caused the chamber temperature to increase. Immediately following the negative pressure increase, from 08:48 to 08:50, the CABs increased their supplied airflow by 1000 scfm (combined). This is inversely proportional to the Kurz flow indications during this same interval. From 09:00 until 09:02, the Kurz showed a "Flow Lo" alarm (triggered when the duct airflow drops below 9,000 scfm). As per the designed intent of the control system, the controller then began to decrease the fuel gas flow into the AB in order to regulate temperature (attachment 3). As the fuel flow decreased the differential between the fuel gas and the CAB widened which triggered a calculated excess air alarm at 09:02 (attachments 1 & 11). From 09:19 until 09:24, the Kurz began showing a malfunction alarm (attachments 1 & 11).

Note: It is possible that a high airflow through the ductwork could cause the Kurz (a hot-wire anemometer system) to become contaminated with moisture, which was drafted off of the Scrubber Tower. This contamination could have sufficiently cooled one of the hot wires to indicate a higher than actual airflow. Because the two sets of hot-wire anemometers reference each other, this cooling may have caused a malfunction in 124-Fit-430.

The DFS operator attempted to adjust for the extreme negative pressure in the AB chamber by regulating the inlet damper to ID fans. At 09:19 (until 09:24) the Kurz showed abrupt changes in flow when it jumped more than 30,000 scfm in just one 30 second cycle (attachment 3). It continued to indicate abrupt changes until 09:24 when it went from 35,910 scfm to 20 scfm (attachment 3). At 09:24, AB burners 1 & 2 "locked-out" causing CABs 1 & 2 to ultimately produce respective flows of 5,268 & 5,329 scfm (attachment 3). This "Hi Fire" response then admitted cooler, high volume air into the heated AB chamber. The cooler air, when mixed with the heated chamber atmosphere, began to expand exponentially. Because the draft from the ID fans had previously been choked down to compensate for the extreme low pressure in the chamber, the newly injected, and rapidly expanding gasses sought the path of least resistance through the Cyclone and into the enclosure.

The hot exhaust gasses then entered the enclosure's vent line and on through the enclosure vent filter system. This abnormal condition was sufficient to ignite the charcoal filter material, in turn igniting the two polyurethane foam seals of the vent filter assembly in a classic fire train scenario. The actions of the control room to regain a negative pressure then eliminated the extreme bellows effect, which then allowed the charcoal filter media to oxidize at a slower, more natural rate. When responding personnel closed the vent tube valve, they forcing the fire into a too rich mixture, effectively smothering the reaction.

Operating procedures (TE-SOP-004) requires that, when the blind flange is in place, the cyclone discharge knife gate and enclosure door be opened to allow for a positive air flow feed from the enclosure into the AB so that a minimum exhaust flow of 9,000 scfm is maintained. By not opening the enclosure door while having the blind flange inserted,

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the ID fans were forced to draw entirely upon the chamber volume supplied by the CABs and fuel gas. Because the ID fans far outmatched the ability of the CABs & fuel air supplies, the AB chamber was then forced to go to –6" negative pressure. The subsequent attempts of the operator to adjust the downstream draft of the ID fans, initially produced results insufficient to return the AB chamber back to the –1" to –2" range.

Note: Intermittent, anomalous readings of zero scfm from 16-Fit-078 & 079 (08:57 until 09:23) are, as of yet, unexplained (attachment 3). As of the time of this writing, there is no supporting data that these zero readings are a contributor to the cause of the extreme negative pressure.

Direct Cause: High temperature, positive pressure gasses were admitted into the DFS Afterburner exhaust system which then pressurized the Cyclone Bin Enclosure with high temperature gasses which ignited the charcoal filter media.

Contributing Causes:

Malfunctioning flow sensor (24-Fit-430) caused a lockout of AB burners #1 & #2

The problems experienced by the CON operator, when trying to control the AB pressures, have several contributing causes:

- When the lockout occurred, the CABs went into a hi fire mode which wasn't immediately realized by the operator as it took several passes through the advisor screens before it had become apparent that the CABs had increased 3-fold.

- Also, 16-Pit-065 (AB chamber pressure) only indicates pressures between 0" W.C. and –6" of W.C. The operator, not knowing how negative (or positive) the AB chamber was, could only make adjustments with the information provided. Thus, when the 16-Pit-065 indicated –6", the operator was making reasonable adjustments to bring the chamber back to a more normal negative pressure –1" to –2". However, he initially had no way of telling how effective his adjustments were at the time. He may have been finitely trying to bring the chamber more positive from a much greater negative than was indicated. The same premise holds true for the positive side of the indicator. When the chamber went to 0" of W.C., it was assumed that it was much more positive than was indicated. However, in an attempt not to overcorrect, the operator was making only reasonable adjustments, which initially had little effect on returning the chamber back to a negative pressure. While attempting to operate outside of his field of view, the operator was effectively flying blind.

- Additionally, The AB pressure indicator is located exclusively on advisor screen DFA (afterburner chamber). While most of the adjustment which are required to induce changes to this AB chamber pressure are located on advisor screens DFI (ID fan inlet), DFD (bleed air), DF1 (AB burner #1), DF2 (A/B burner #2). The need to

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scroll through all of these screens decreases the potential information capture rate of the operator which eventually slowed his response to the dynamic indicators.

- The position of the ID fan inlet damper and the bleed air valve did not allow for the ID fans to capture 100% of the volume/pressure produced in the A/B.

Root Cause: Failure to follow procedure. By not keeping the cyclone enclosure door open, and by not installing the filter screen at the opening, there was no way the supply the required balance of make-up air into the AB chamber. So the AB went extremely negative.

Corrective Action Recommendations:

Immediate Corrective Actions: Regain control of DFS AB pressure, control fire and limit personnel access to area. Assure fire has extinguished.

Corrective Actions to Preclude Occurrence: Assure that a negative pressure is maintained in the exhaust ducting by controlling the feed air supplied, and exhaust restrictions, of the burner exhaust systems by:

- Assure that the cyclone enclosure door remains open, and ventilation screen installed, when installing blind flange (Per: TE-SOP-004).

- Evaluate the Kurz flow sensor for accuracy, and make corrections/repairs, or reposition as needed in order to eliminate further potential for contamination & subsequent malfunction.

- Redefine the readout parameters of 16-Pit-065 to show a maximum attainable range (wider than 0" to –6") such that there will be more accurate information available for the operator to be able to determine whether gross, or finite adjustments are required.

- Instruct DFS operators to recognize that an abrupt change in chamber pressure may indicate greater than the amounts indicated, and that gross adjustments will most likely be most effective.

- Add A/B chamber pressure readouts to other associated advisor screens such as DFI, DFD, DF1 & DF2.

Additional Corrective Action:

Install a flame arrestor screen downstream of the filter assembly in the vent line to prevent fire from reaching the MDB filter banks.